CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

The quaternized chitosan (QCh) was synthesized successfully for improving water solubility by introducing quaternary ammonium group on chitosan. The degree of quaternization of QCh was calculated by ^{1}H NMR in a range of 72.0 ± 0.3 % and zeta potential of QCh was 24-29 mV.Tetracycline-loaded QCh nanoparticles was prepared by ionic gelation method using TPP as a cross-linking agent. The obtained TC-loaded QCh nanoparticles with difference ratios of QCh: TC from 1:1 to 1:5 were spherical with average particles size of 450-800 nm by SEM and DLS. The Encapsulation efficiency (EE) of TC-loaded QCh nanoparticles was about 72 – 95 %, with innitial TC of 2.5 – 12.5 mg/mL.When incresing amount of TC content into QCh nanoparticles lead to EE and average size increased.The success of TC encapsulation was confirm by UV-Vis spectrophotometry, XRD, IR and TGA. The *in vitro* release studied of TC from QCh nanoparticles in PBS buffer (pH7.4) and Acetate buffer (pH 5.5) indicated that particles size inflienced its release rate from the QCh nanoparticles. The antibacterial activity of wound dressing against *E.coli*, *S.aureus* and *Ent.faecium* was success and can inhibit all of bacterial within 24 hours. The cytoxicity was evaluated by MTT assay, show that only the wound dressing with TC-loaded QC chitosan of ratio 1:3 had viable L929 and FB cells more than 80 % for 1 day and 3 day.Therefore, The wound dressing that suitables for the better treatment which had both efficiency antibacterial activity and biocompatibility for cells was the wound dressing of ratio 1:3.